(19) Europäisches Patentamt
European Patent Office
Office européen des brevets

(11) Publication number : **0 519 722 A1**

(12) EUROPEAN PATENT APPLICATION

(21) Application number : **92305606.3**

(22) Date of filing : **18.06.92**

(51) Int. Cl.[5] : **F16K 7/04,** F16L 55/10, A61M 5/175, B25B 5/10

(30) Priority : **21.06.91 GB 9113501**

(43) Date of publication of application : **23.12.92 Bulletin 92/52**

(84) Designated Contracting States : **AT BE CH DE DK ES FR GB GR IT LI LU MC NL PT SE**

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(54) Pipe closure device.

(57) The invention relates to a pipe closure device (1) for the temporary closing of plastics pipes, such as when work needs to be effected eg. the connection of a branch line or the repair of a particular section. The object of the invention is to facilitate this by means able to limit the compression of a pipe to a predetermined degree dictated by wall thickness and whereby to achieve closing without damage to the pipe wall. This objective is met by a construction comprising a first bar (2), a second bar (10) in spaced relationship to the first bar (2), a means at each of said bars (2,10) for adjusting said bars (2,10) towards and away from each other, a stop means (3,11) at each end of said bars (2,10) for limiting the degree to which said bars (2,10) can be adjusted towards each other, said stop means (3,11) on said second bar having a number of abutment faces (4,12) at different heights from the periphery of the surface of said bar (2,10), and said adjustment means (9,15) to one side being disconnectable to allow said second bar (10) to swing about a rotatable connection to the adjustment means (9,15) to the opposite side of said bars (2,10) and to be rotated to bring other of its said abutment faces (4,12) into the operative disposition, and then swing back for reconnection to said adjustment means (9,15).

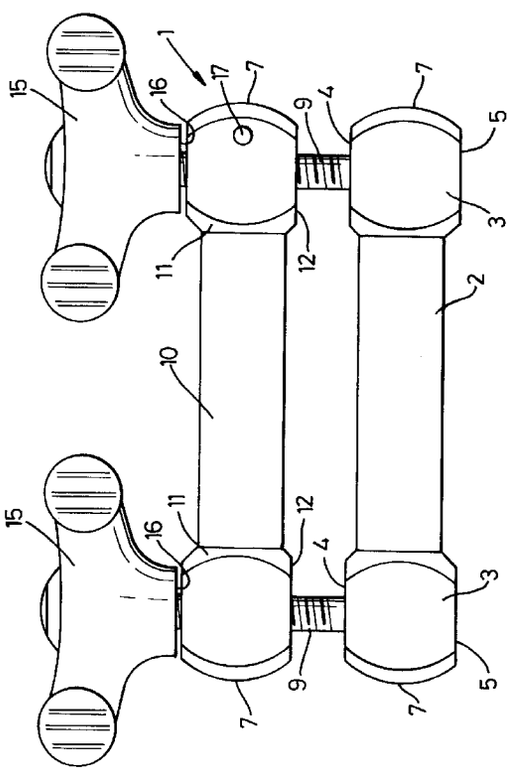

Fig.1

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This invention relates to a pipe closure device, and is particularly concerned with a device for the temporary closure of a plastics pipe of a plastics material such as polyethylene.

There is the extensive use of plastics pipes for the carrying of a gas or a liquid, and following the laying of a plastics pipeline, there are those occasions where such as a branch line needs to be connected to a particular point along the laid pipeline, or the need to repair a particular section of the laid pipe.

To close off the supply of gas or liquid at source and to enable appropriate work to be effected at a particular point along the length of the pipeline is frequently impossible, with the attendant need to provide an effective means of temporarily closing a pipeline adjacent to and upstream of the position where an attachment is needed or a repair to be effected.

It is known to effect a temporary closing of a plastics pipe by applying a compressive force to squeeze the pipe flat. However, given the wide variety of pipe wall thicknesses, and given the need to ensure that a pipe is not crushed, means to squeeze a pipe flat as are known are only suited to one pipe wall thickness or must be provided with adjustable stops.

The object of the present invention is to provide a means of effecting a temporary closing of a plastics pipe able to be applied to a range of different pipe wall thickness.

According to the present invention, a means for closing a plastics pipe comprises a first bar, a second bar in spaced relationship to the first bar, a means at each of said bars for adjusting said bars towards and away from each other, a stop means at each end of said bars for limiting the degree to which said bars can be adjusted towards each other, said stop means on. said second bar having a number of abutment faces at different heights from the periphery of the surface of said bar, and said adjustment means to one side being disconnectable to allow said second bar to swing about a rotatable connection to the adjustment means to the opposite side of said bars and to be rotated to bring other of its said abutment faces into the operative disposition, and then swing back for reconnection to said adjustment means.

Thus, the stop means on said second bar may be provided with two opposite abutment faces or be of cubic form to provide four abutment faces each of which can be selectively brought into a position where tightening of the adjustment means brings the selected faces on the stop means into contact with the contact faces on the stop means of the first bar to provide four minimum spacings between the bars to enable the closing of two or of four pipes of different wall thickness with the guarantee that the pipe will not be crushed.

To further increase the numbers of pipe wall thicknesses to which the closing means can be applied, the first bar may similarly be provided with stop means to provide two abutment faces or be of cubic form to provide four abutment faces. Thus, the first bar can be relocated on the adjustment means to present any one of its two or of its four abutment faces towards the stop means on the second bar, and hence provide up to four or up to sixteen different minimum spacings between the bars.

The adjustment means to each side may be a threaded rod with a ball to engage in a cavity in the stop means to each side of the lower bar, each abutment face and each outermost end face being slotted to allow the passage of the threaded rod. for ease of production each bar and its stop means may be of identical construction.

Thus, in its first operative condition, the eg wing nuts are slackened, and then swung to bring the screwed rod clear of its respective stop means, and when the second bar can be swung about its ball connection to the other screwed rod. The bars can then be positioned around a pipe and the said second bar swung back to a position where the said one screwed rod can be repositioned through the respective stop means, and the eg wing nuts tightened to cause the compression and closing of the pipe between the bars, without its being crushed.

To accomodate a pipe of a different wall thickness, said one screwed rod can again be disconnected from its stop means, and following swinging of the second bar about the ball on the other screwed rod, the second bar can be rotated about its axis to bring a second pair of abutment faces into an operative position, to allow the bars to be engaged around a pipe of a different wall thickness, and to allow the compression and closing of said different pipe again to allow closing without crushing.

Two embodiments of the invention will now be described with reference to the accompanying drawings, in which:

Figure 1 is a side elevation of a first embodiment of closure means according to the invention;

Figure 2 is an end elevation of the closure means of Figure 1; and

Figure 3 corresponds to Figure 1 but shows a second embodiment of closure means according to the invention.

In Figures 1 and 2, a closure means 1 has a bottom bar 2 with a stop means 3 at each end. Each stop means 3 has an abutment face 4 set at one distance from the axis of the bar 2, and a second stop face 5 set at a second distance from said axis and each stop means 3 has a transverse slot 6 extending between the faces 4, 5 and emerging in the outermost face 7. Centrally of each stop means 3 is a spherical cavity, in which is located a ball 8 to which is attached a threaded rod 9.

A second bar 10 is provided with stop means 11 at each end, each stop means having an abutment face 12 at the same distance from the axis of the bar.

For ease of production, the bars 2 and 10 are identically formed, hence providing a transverse slot 13 in each stop means 11 extending between the abutment face 12 and an opposite face 14, through which the threaded rods 9 pass, wing nuts 15 being provided each with an end face 16 to contact the respective faces 14 of the stop means 11.

To prevent disengagement of one of the rods 9 from the respective stop means 11, a locking pin 17 is provided.

To locate the closure means on a pipe, each wing nut 15 is unscrewed along but not removed from the rods, to allow one of the rods to be swung about its ball connection 8 to its stop means 3, and when the bar 2 can be swung to put its axis in line with the axis of the tethered rod 9. The bar 2 can then be rotated to put either its faces 4 or its faces 5 into an operative position, selected in accordance with the wall thickness of the pipe to be closed, the bars 2 and 10 then being located to either side of the pipe, the rod 9 swung back to engage in its slot 13 in the stop means 11, and the wing nuts tightened to close the abutment faces 12 on to the abutments faces 4 or 5.

The selection of the face 4 or the face 5 as the operative abutment face enables the closure of a number of pipes of different wall thickness with an assurance that the pipe will not be damaged.

To enable an even greater number of pipe wall thicknesses to be accommodated, the pin 17 can be dispensed with to allow disengagement of the top bar 10 from both rods 9, and the top bar reversed to position the face 16 towards the faces 4 or 5. By having the faces 14 at a different distance from the axis of the bar 10 than the faces 12, yet another range of pipe wall thicknesses can be accommodated.

As shown by Figure 3, the ranges of pipe wall thicknesses that can be accommodated by the closure means of the invention, can be maximised by providing opposite faces 18 and 19 on each of the stop means 3 of the bar 2 at different distances from the axis of the bar to each other and to the faces 4 and 5. Similarly the stop means 11 have opposite faces 20 and 21 at different distances from the axis of the bar 10 to each other and to the faces 12 and 14. In the stop means 3 a second transverse slot 22 is provided at 90° to the slot 6 and emerging in the outermost face 7, and in the stop means 11 a second transverse slot 23 is provided at 90° to the slot 13 and emerging in their outermost faces. Thus, each bar has four pairs of abutment faces all at different heights providing sixteen possible settings of the maximum extent to which the bars can be closed on to a pipe.

Claims

1. A means (1) for closing a plastics pipe characterised by a first bar (2) a second bar (10) in spaced relationship to the first bar (2), a means (9, 15) at the end of said bars (2, 10) for adjusting said bars towards and away from each other, a stop means (3, 11) at each of said bars for limiting the degree to which said bars can be adjusted towards each other, said stop means (3) on said bar (2) having a number of abutment faces (4, 5) at different heights from the periphery of the surface of said bar (2), and said adjustment means (9, 15) being disconnectable to allow said bar (2) to swing about a rotatable connection to the adjustment means (9, 15) to the opposite side of said bars and to be rotated to bring other of its said abutment faces into the operative disposition following which the bars are reconnected to said adjustment means.

2. A means as in Claim 1 characterised in that said stop means (3) on said bar (2) is provided with two opposite abutment faces (4, 5).

3. A means as in Claim 1 characterised in that said stop means (3) on said bar (2) is of cubic form to provide four abutment faces (4, 5, 18, 19), each of which can be selectively brought into a position where tightening of the adjustment means (9, 15) brings the selected faces on the stop means (3) into contact with the contact faces (12) on the stop means (11) of the bar (10).

4. A means as in any of Claims 1 to 3 characterised in that to further increase the number of pipe thicknesses to which the closing means can be applied, the bar (10) may be provided with stop means (11) to provide two abutment faces (12, 14).

5. A means as in Claim 4 characterised in that the stop means (11) are of cubic form to provide four abutment faces (12, 14, 20, 21), and whereby the bar (10) can be relocated on the adjustment means (9, 15) to present any one of its four abutment faces towards the stop means (3) on the bar (2).

6. A means as in any of Claims 1 to 5 characterised in that the attachment means (9) are pivotably secured in a respective transverse slot (6) in the stop means (3) and extend disconnectable through a respective transverse slot (13) in the stop means (11).

7. A means as in Claim 6 wherein one attachment means (9) is held against removal from within its transverse slot (13).

8. A means as in Claim 6 wherein a second transverse slot (22, 23) is provided through each stop means (3, 11), at 90° to the first transverse slot (6, 13).

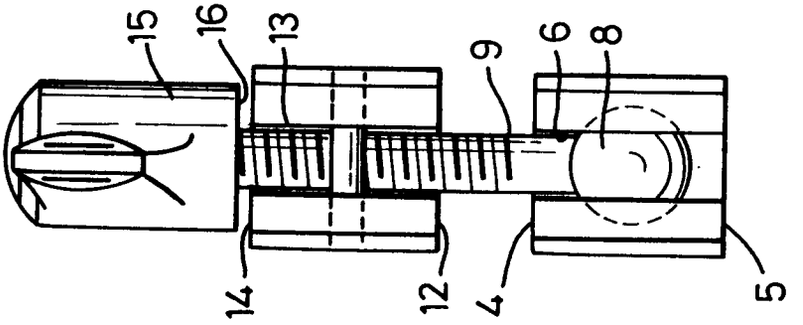

Fig. 2

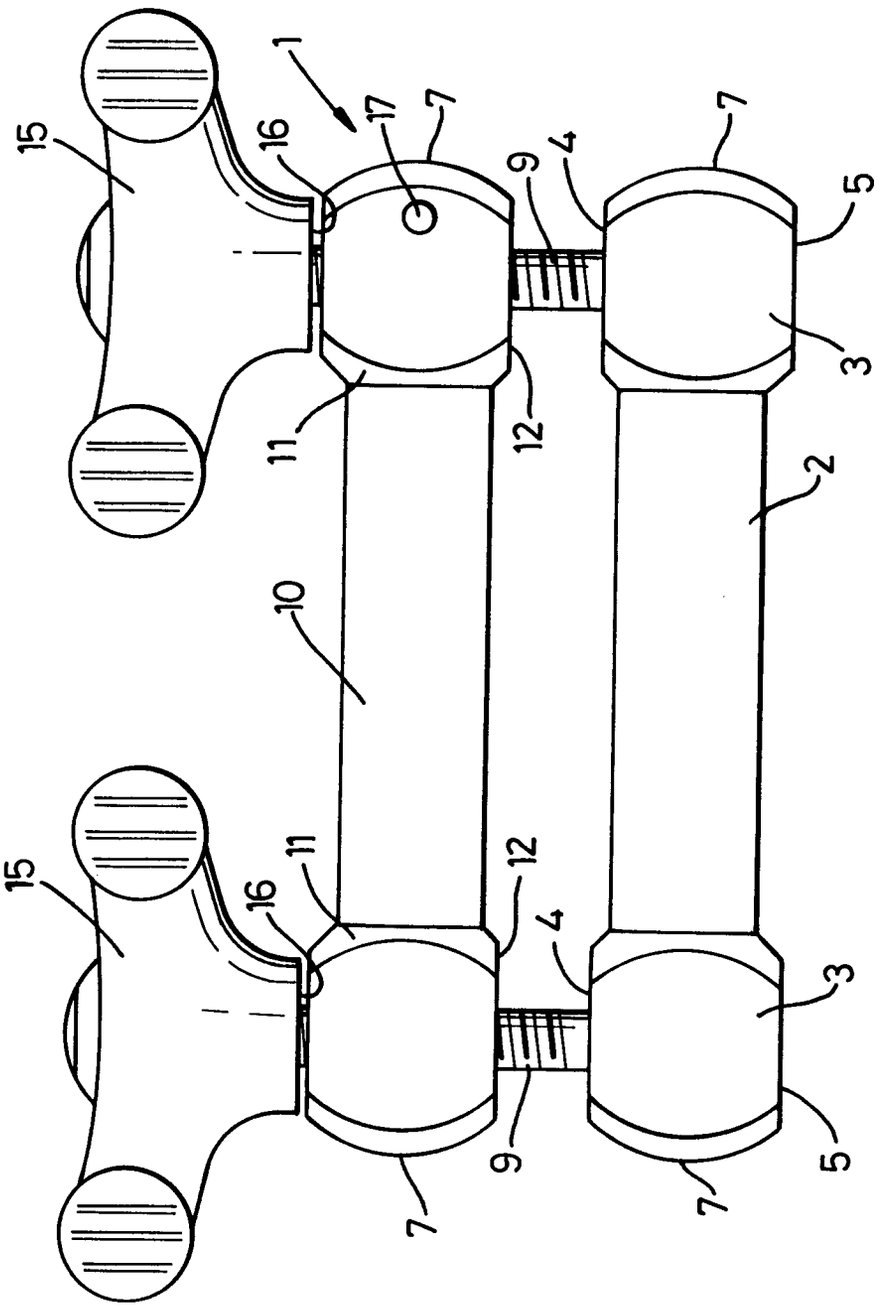

Fig. 1

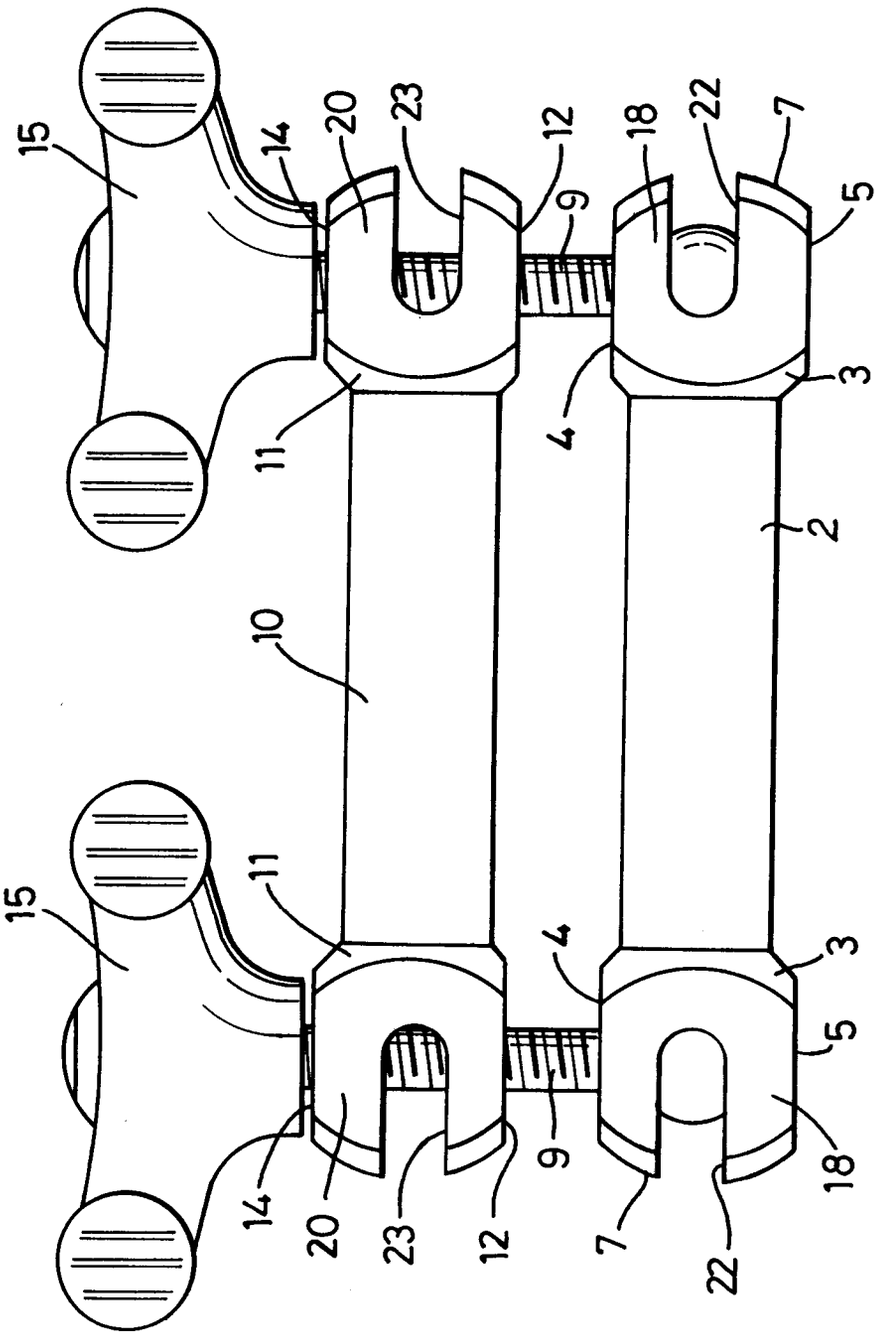

Fig. 3

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EUROPEAN SEARCH REPORT

Application Number EP 92305606.3

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int. Cl.5)
A	US - A - 2 865 591 (ALIDA VIOLA HOLINSHEAD) * Totality *	1,2	F 16 K 7/04 F 16 L 55/10 A 61 M 5/175 B 25 B 5/10
A	DE - A - 2 835 888 (TERSTEEGEN) * Totality *	1,5	
A	US - A - 2 841 358 (T.B. RUSSELL) * Totality *	1,2	
A	DE - B - 2 026 127 (I.V. OMETER) * Totality *	1	
A	US - A - 2 908 476 (W.E. MIDDING) * Totality *	1	
A	DE - A - 3 324 282 (SCHLITTER)		TECHNICAL FIELDS SEARCHED (Int. Cl.5)
A	CH - A - 596 958 (J. HERSCHE)		F 16 K 7/00 F 16 L 3/00 F 16 L 55/00 A 61 M 5/00 B 25 B 5/00
A	FR - A - 2 063 046 (ILLINOIS TOOL WORKS INC.)		

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
VIENNA	02-09-1992	SCHUGANICH

CATEGORY OF CITED DOCUMENTS

X : particularly relevant if taken alone
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D : document cited in the application
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